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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,296	02/15/2005	Mayumi Uno	10873.1606USWO	6008

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EXAMINER	
VERDERAME, ANNA L	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
08/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,296	UNO ET AL.	
	Examiner	Art Unit	
	ANNA L. VERDERAME	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7 and 10-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7 and 10-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/03/2009 has been entered.

DETAILED ACTION

The response filed on 12/17/2008 has been carefully considered. A response is presented below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,3-5, 7-10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163.

4. In example 3 of Kitaura et al. a 4-layer optical recording medium is disclosed. The fourth recording layer is made of Te-O-Pd and has a thickness of 20 nm, the third recording layer is made of Te-O-Pd and has a thickness of 10 nm, The second

recording layer is made of Te-O-Pd and has a thickness of 8 nm and the first recording layer is made of Te-O-Pd and has a thickness of 6 nm (0098-0103). The medium of the copending application is a write-once optical recording medium and thus the change upon recording is irreversible (abstract). The Te-O-M recording material is described at (0039-0041). Optical constants for the Te-O-Pd recording layer are disclosed at (0093). A reactive sputtering method for forming the Te-O-Pd layers is disclosed at (0103). A mixed gas atmosphere of Argon and Oxygen is used. Te-Pd targets are disclosed at for example (0102). High C/N ratios are disclosed for this medium(0105).

Regarding the amendment of claim 1 to require that the amount of Pd in the film is 8at%, the examiner notes that Kitaura et al. discloses that the amount of Pd can range from 1at% to 35 at%. This range includes a Pd content of 8at%(emphasis added). In an example a recording composition of $Te_{42}O_{53}Pd_5$ is used.

Kitaura et al. does not explicitly teach the limitations of the instant claims regarding the transmittance of the crystalline and amorphous phases of the j-th recording layer. The reference further does not explicitly disclose the limitations of instant claims 1, 3 and 13.

Nishiuchi et al. discloses the transmittance for a Te-O-Pd film in both the crystalline and the amorphous phase as a function of thickness (figure 3). The Te-O-Pd film used is $Te_{42}O_{46}Pd_{12}$ (p.2164 first column). Films having a thickness of 6 nm meet the limitations recited in instant claims 1, 3, 13, and 16.

As stated above Kitaura et al. discloses a range for Pd which includes 8at%. Therefore a film having 8at% Pd would be obvious in view of the disclosure of Kitaura et al. The film for which Nishiuchi et al. discloses transmittance for both the amorphous phase and the crystalline phase as a function of thickness has 12 at%Pd. It is the position of the examiner that a Te-O-Pd film having 8 at % Pd/metal will be less reflective and therefore more transmissive than a film having the same thickness and having 12 at% Pd/metal. Therefore, a film containing 8at% Pd will also meet the limitations of claims 1, 3 and 13 because as shown by Nishiuchi et al. a film having 12 at% Pd meets these limitations.

A film having a composition $Te_{44}O_{48}Pd_8$ is obvious in view of the disclosure of Kitaura et al. and will meet the limitations of claims 1,3, and 13 for the reasons provided above.

It would have been obvious to use the $Te_{44}O_{48}Pd_8$ material in the 4-layer optical recording medium taught by Kitaura et al. based on the fact that the composition falls within the desired ranges for the Te-O-Pd composition recited in the copending application at (0039-0041) and with a reasonable expectation of forming a multi-layer optical recording medium that meets the limitations recited in the instant claims. The $Te_{44}O_{48}Pd_8$ will be expected to meet the limitations recited in claims 1,3, and 13 based on the disclosure in Nishiuchi et al. which shows that a Te-O-Pd film having 12at% Pd/metal meets these limitations. See reasoning above.

With regard to the limitations regarding variation of the amount of oxygen and/or metal in each recording film, it is the position of the examiner that these are known result-effective variables and thus it would be obvious to optimize *In re Boesch*, 617 F.2d 272, 205 USPQ 215. At (0040) Kitaura teaches that when O atoms are contained in the film in an amount less than 25 at % the heat conductivity of the recording layer may be too high which may result in large recording marks and that when O-atoms are in the amount of 60 at% or more the heat conductivity of the recording layer may be too low which may prevent a sufficiently large recording mark from being formed. Thus it is shown that increasing the O-atom concentration has the predictable result of decreasing the conductivity of the film and decreasing the O-atom concentration has the predictable result of increasing the conductivity of the film. At (0041) Kitaura et al. discloses that when M atoms are present in an amount less than 1 at% the growth of Te crystals during crystallization which may cause insufficient crystallization speed and when M atoms are in an amount more than 35 at% that the reflectance difference between the amorphous and crystalline states may become too small which may lower the C/N ratio. Thus it would be obvious to optimize to obtain a film having good sensitivity and a high C/N ratio. Kitaura et al. also recognizes that the thickness of the recording layer affects the properties of the layer (0043). When the thickness of the layer is less than 2nm sufficient reflectance and change in reflectance may not be provided and the C/N may be lowered. When the thickness of the recording layer is more than 70 nm the

thermal diffusion in the film may be increased so that the C/N ratio may be lowered. Thin layers are going to be able to dissipate heat faster than thicker layers and thin layers are going to be more transmissive than thicker layers. Further, in a multi-level medium the ability to access further recording layers is taken into consideration (0033). If for example a first recording layer is too reflective access to further recording layers is limited. Based on this disclosure it would be obvious to one of ordinary skill in the art to optimize the thickness and the composition of each of the recording layers of a multi-level medium.

The examiner points to sections (0021-0022) of the applicant's specification which disclose effects achieved by varying the M-atom and O-atom concentration in the recording films. The ultimate goal is to form a medium having a high C/N and high-transmittance (so the laser can reach further layers). Adjustment of the M-atom concentration is done to achieve high sensitivity and transmittance.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163 as applied above and further in view of Imaino et al. US 5,555,537.

Kitaura et al. US 2002/0122366 in view of K. Nishiuchi, H. Kitaura, N. Yamada, and N. Akahira. Japanese Journal of Applied Physics. 37(1998) 2163 does not teach the limitation of claim 11.

Imaino et al. teaches sub-oxide recording materials for use in write-once optical recording media. TeO_x, GeO_x, and SbO_x films having metallic additives such as Pd, Ni, or Cu are disclosed at (10/28-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the 4-layer optical recording medium rendered obvious by the combination of Kitaura et al. in view of Nishiuchi et al. by forming one or both of the third and fourth recording layers of a recording material such as Ge-O-Pd or Sb-O-Pd based on the disclosure of these materials for use in write-once optical recording media and with a reasonable expectation of forming an optical recording medium that still meets the limitations recited in instant claims, especially claims 1,3 and 13.

Response to Arguments

7.

Applicant argues that neither Nishiuchi et al. nor Kitaura et al. disclose a Te-O-Pd recording layer composition wherein Pd is contained in the amount of 8 at%.

As stated above Kitaura et al. discloses a range for Pd which includes 8at%. Therefore a film having 8at% Pd would be obvious in view of the disclosure of Kitaura et al. The film for which Nishiuchi et al. discloses transmittance for both the amorphous phase and the crystalline phase as a function of thickness has 12 at%Pd. It is the position of the examiner that a Te-O-Pd film having 8 at % Pd/metal will be less reflective and therefore more transmissive than a film having the same thickness and

having 12 at% Pd/metal. Therefore, a film containing 8at% Pd will also meet the limitations of claims 1, 3 and 13 because as shown by Nishiuchi et al. a film having 12 at% Pd meets these limitations.

Regarding adjusting the oxygen content so that the oxygen content in layers nearer the light incidence plane is less than that in further layers, the examiner notes that oxygen content has been shown to be a result effective variable and therefore it would have been obvious to vary the oxygen content in the film in order to optimize the properties of the recording film with a reasonable expectation that the result of such variations will be predictable. Further as the use of Pd for 5 and 12% is exemplified and these bound the recited 8% there is a reasonable expectation of success in forming a useful optical recording medium using the 8% Pd in one of the recording layers , the percentage being within the broader 1-35% range taught by Kitaura et al..

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anna L Verderame/
Examiner, Art Unit 1795

/Martin J Angebranndt/
Primary Examiner, Art Unit 1795